

# Institution Profiling Systems at IU: VIVO et al.

Several slides are from a presentation to OVPR in 2010.

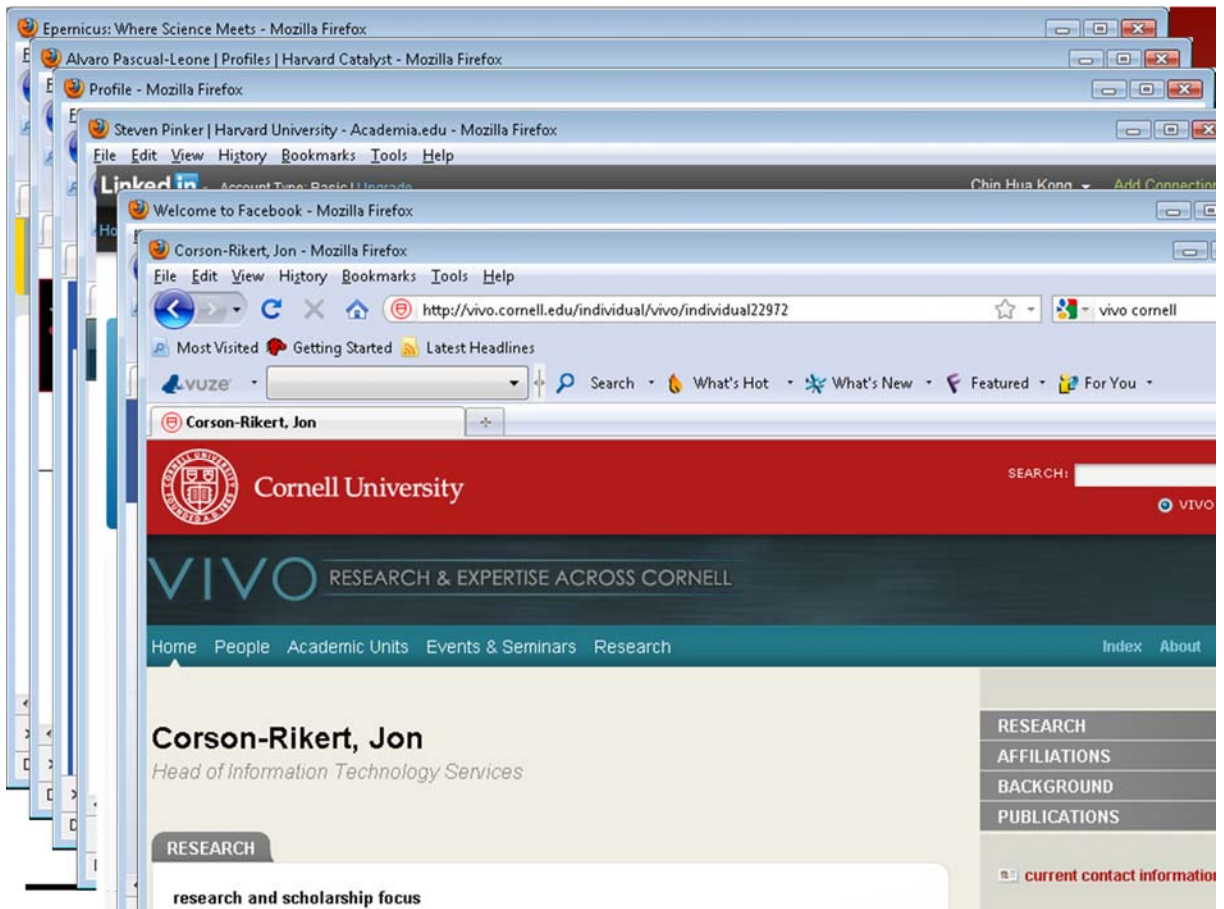
Chin Hua Kong – SLIS  
Robert Light - SLIS  
Katy Borner – SLIS

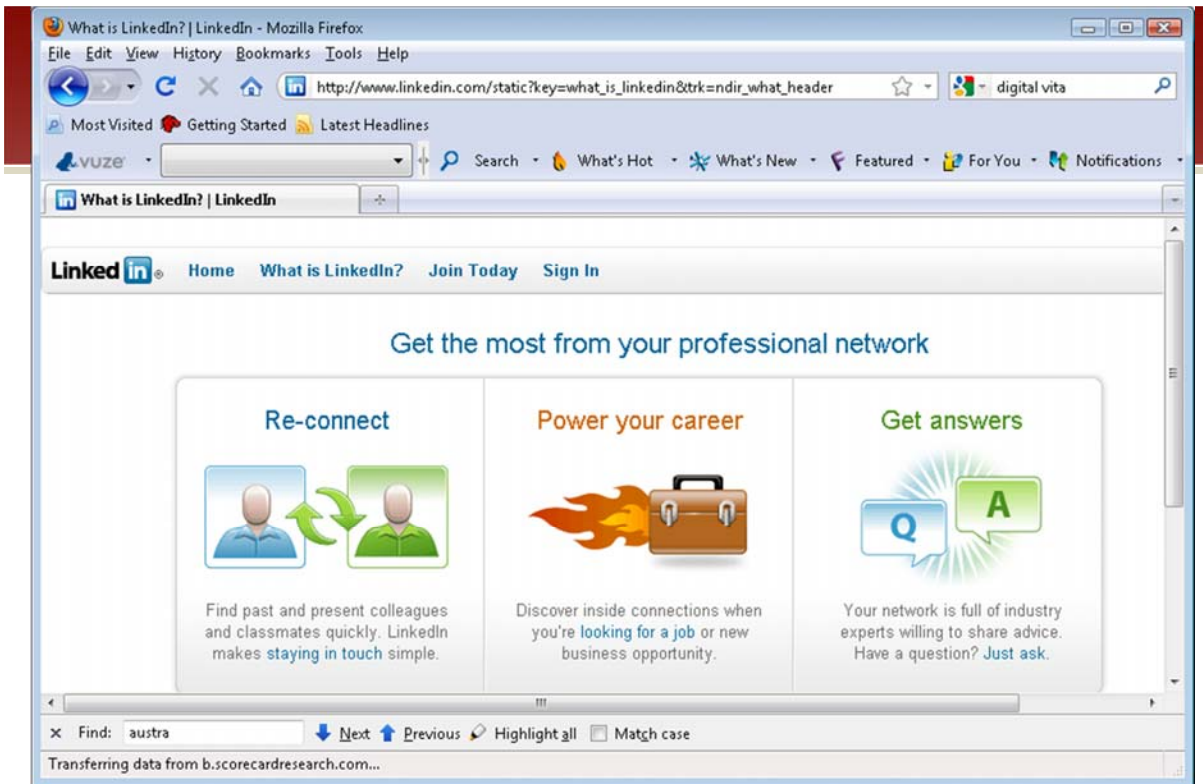
I would like to thank Ryan Cobine and David Cliff for their input.

Statewide IT Conference (SITC), IUB. Sept 25 at 11:30AM, Oak room, IMU.



INDIANA UNIVERSITY





See review of 45+ systems at

[http://en.wikipedia.org/wiki/Comparison\\_of\\_Research\\_Networking\\_Tools\\_and\\_Research\\_Profiling\\_Systems](http://en.wikipedia.org/wiki/Comparison_of_Research_Networking_Tools_and_Research_Profiling_Systems)

## Overview

- What is VIVO?
- How does it work?
- How have we implemented it at Indiana University?
- How is it used?
- Incentives & challenges

## VIVO Collaboration:

**Cornell University:** Dean Krafft (Cornell PI), Manolo Bevia, Jim Blake, Nick Cappadona, Brian Caruso, Jon Corson-Rikert, Elly Cramer, Medha Devare, John Ferreira, Brian Lowe, Stella Mitchell, Holly Mistlebauer, Anup Sawant, Christopher Westling, Rebecca Younes. **University of Florida:** Mike Conlon (VIVO and UF PI), Cecilia Botero, Kerry Britt, Erin Brooks, Amy Buhler, Ellie Bushhousen, Chris Case, Valrie Davis, Nita Ferree, Chris Haines, Rae Jesano, Margeaux Johnson, Sara Kreinest, Yang Li, Paula Markes, Sara Russell Gonzalez, Alexander Rockwell, Nancy Schaefer, Michele R. Tennant, George Hack, Chris Barnes, Narayan Raum, Brenda Stevens, Alicia Turner, Stephen Williams. **Indiana University:** Katy Borner (IU PI), William Barnett, Ryan Cobine, Shanshan Chen, Ying Ding, Russell Duhon, Jon Dunn, Micah Linnemeier, Nianli Ma, Brian Keese, Robert McDonald, Barbara Ann O'Leary, Mark Price, Yuyin Sun, Alan Walsh, Brian Wheeler, Angela Zoss. **Ponce School of Medicine:** Richard Noel (Ponce PI), Ricardo Espada, Damaris Torres. **The Scripps Research Institute:** Gerald Joyce (Scripps PI), Greg Dunlap, Catherine Dunn, Brant Kelley, Paula King, Angela Murrell, Barbara Noble, Cary Thomas, Michaelen Trimarchi. **Washington University, St. Louis:** Rakesh Nagarajan (WUSTL PI), Kristi L. Holmes, Sunita B. Koul, Leslie D. McIntosh. **Weill Cornell Medical College:** Curtis Cole (Weill PI), Paul Albert, Victor Brodsky, Adam Cheriff, Oscar Cruz, Dan Dickinson, Chris Huang, Itay Klaz, Peter Michellini, Grace Migliorisi, John Ruffing, Jason Specland, Tru Tran, Jesse Turner, Vinay Varughese.

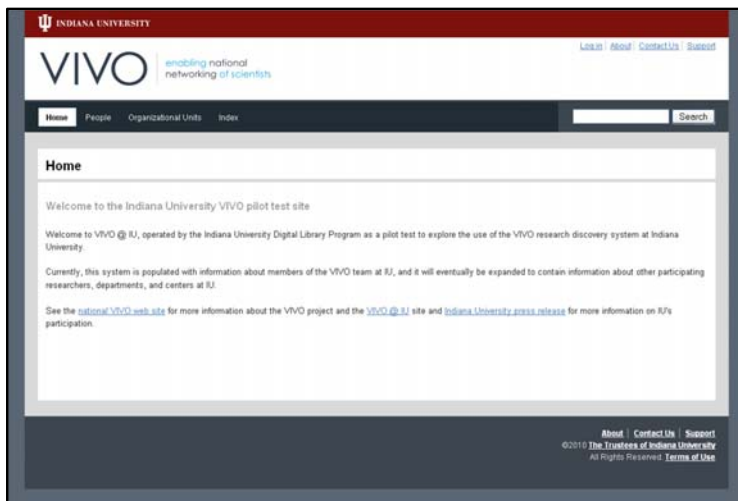
## What is VIVO?

An open-source **semantic web application** that enables the discovery of research and scholarship across disciplines in an institution.

Populated with **detailed profiles** of faculty and researchers; displaying items such as publications, teaching, service, and professional affiliations.

A **powerful search functionality** for locating people and information within or across institutions.



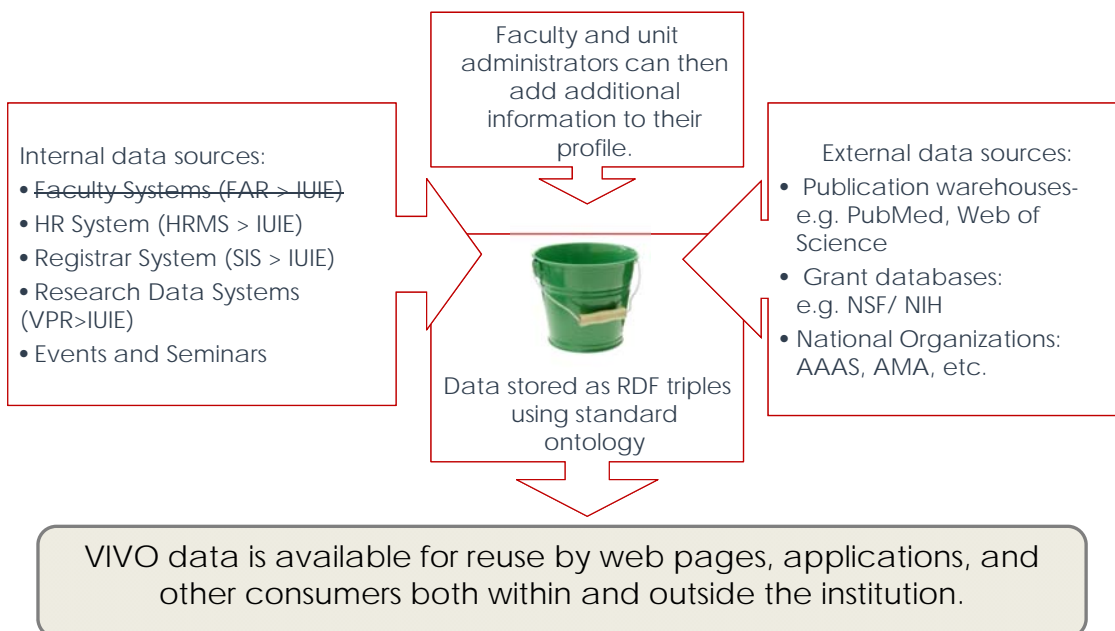


VIVO is a resource of Indiana University that provides information on:

- people
- departments
- facilities
- courses
- grants
- publications

vivo.iu.edu

## VIVO harvests data from IU verified sources

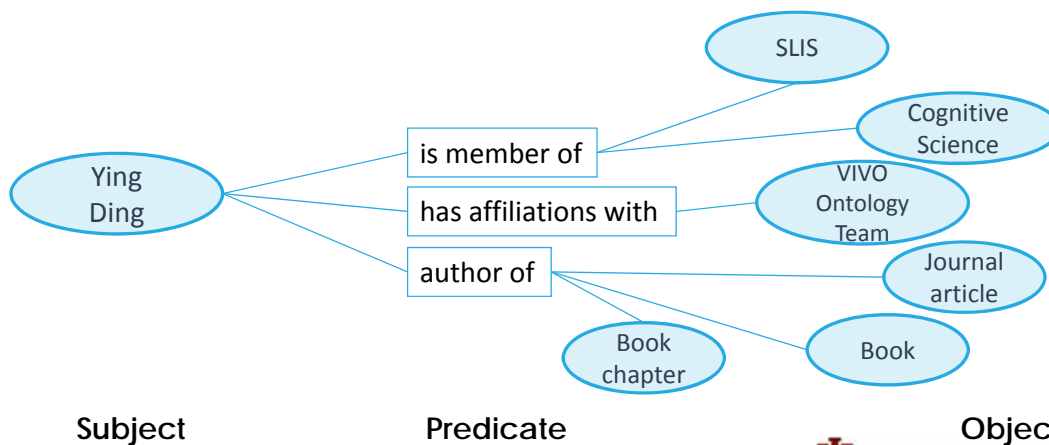


# Linked Data Principles

- Tim Berners-Lee:
  - Use URIs as names for things
  - Use HTTP URIs so that people can look up those names
  - When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL)
  - Include links to other URIs so that people can discover more things
- <http://www.w3.org/DesignIssues/LinkedData.html>
- <http://linkeddata.org>
- <http://www.data.gov/>
- <http://data.gov.uk/>

# Storing Data in VIVO

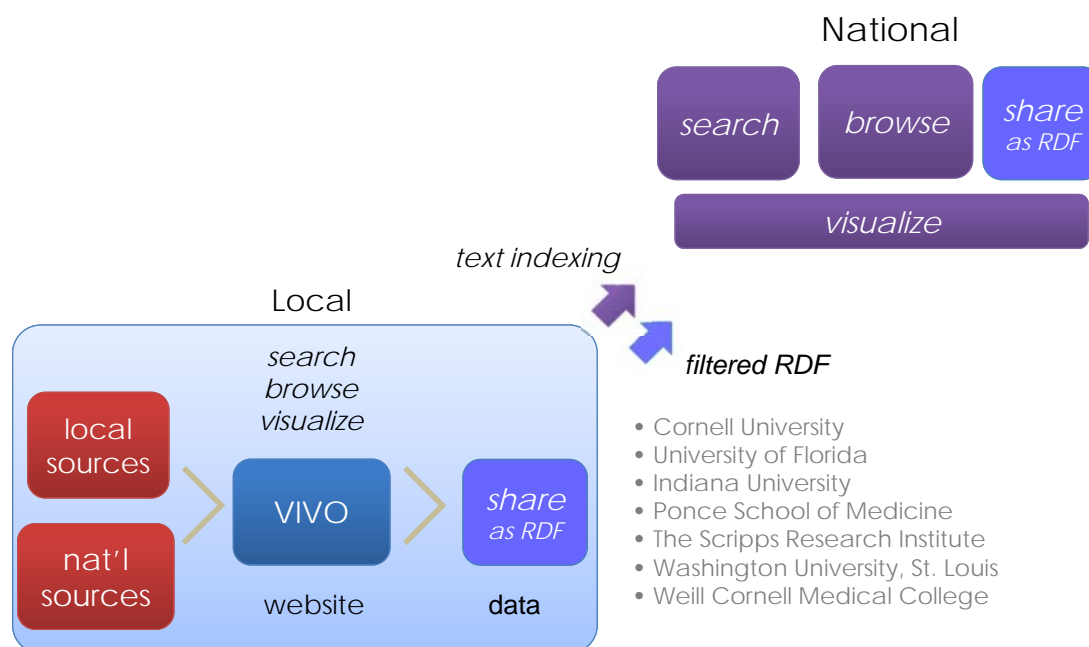
- Information is stored using the **Resource Description Framework (RDF)** .
- Data is structured in the form of "triples" as subject-predicate-object.
- Concepts and their relationships use a **shared ontology** to facilitate the harvesting of data from multiple sources.



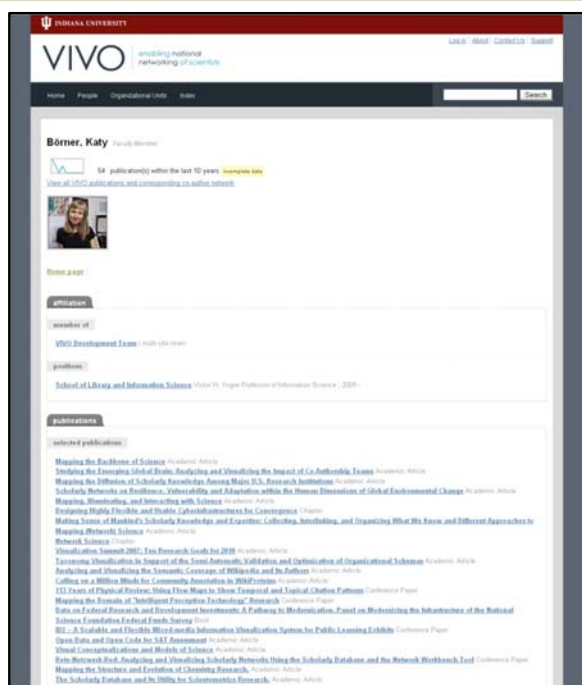
# VIVO Standard Ontology

- Network Structure: foaf:Person, foaf:Organization, vivo:InformationResources
- Individual
  - Research (bibo:Document, vivo:Grant, vivo:Project, vivo:Software, vivo:Dataset, vivo:ResearchLaboratory)
  - Teaching (vivo:TeacherRole, vivo:AdvisingRelationship)
  - Services (vivo:Service, vivo:CoreLaboratory, vivo:MemberRole, )
  - Expertise (vivo:SubjectArea)

# Linked Data: Local to National Scale



# A VIVO profile will allow researchers to:



**Map colleagues** by research area, authorship, and collaborations.

**Showcase** credentials, expertise, skills, and professional achievements.

**Connect** within research areas and geographic expertise.

**Display** current research, and selected publications.

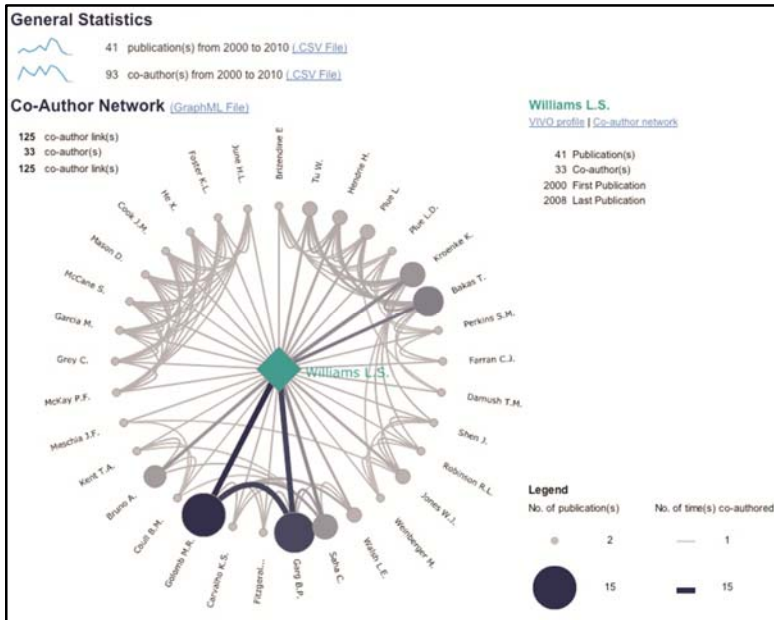
**Publish** the URL or link the profile to other applications.

## Incentives

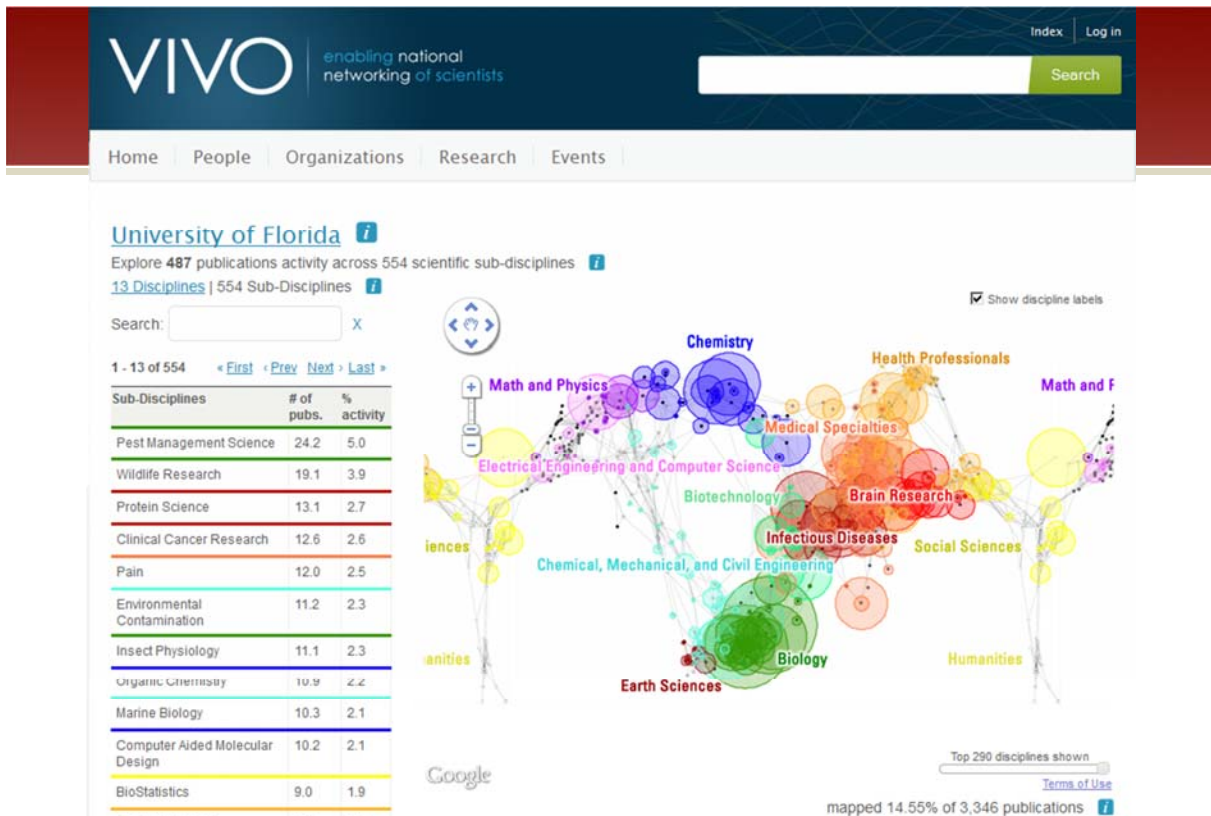
- Federated Searching Across Domains
  - CTSA Federated Search
  - VIVO Federated Search
- NIH/NSF Biosketch Generation
- Mapped Data from IU Institutional Data Sources
  - 80/20
- Visualization and Scientometric Mapping Components



# Visualization

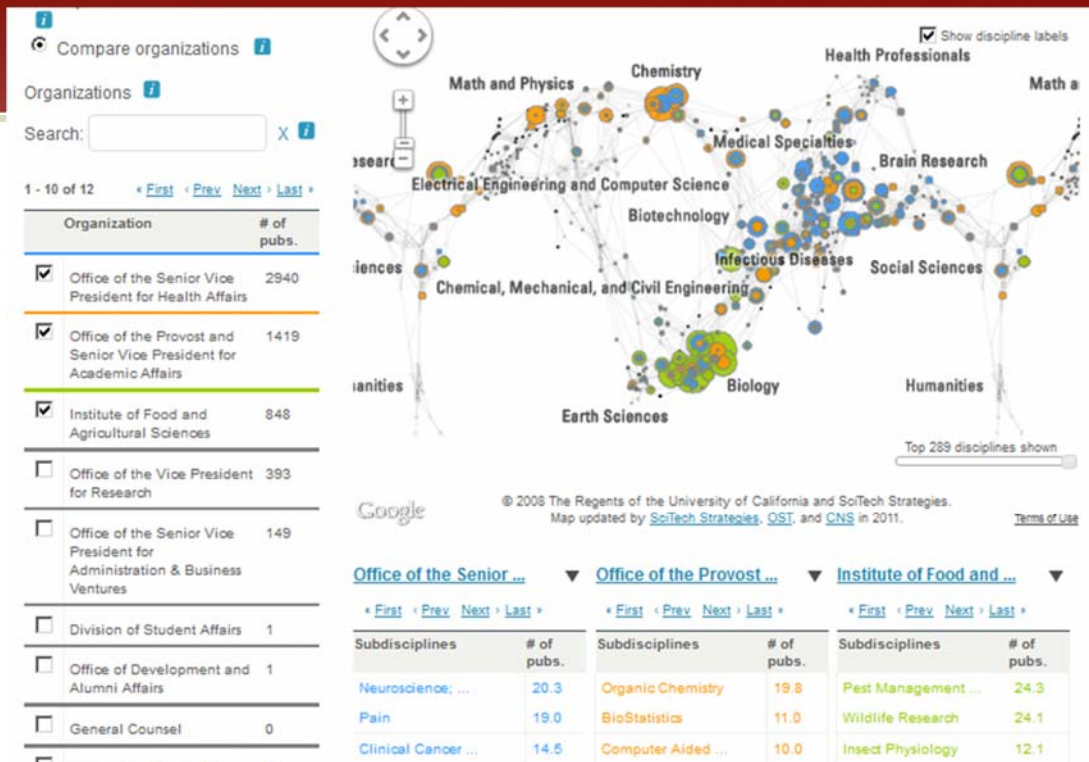


- **Display** visualizations of complex research networks and relationships.



**Topical Analysis (What)** Science map overlays show where a person, department, or university publishes most in the world of science. (in work)





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# Current versions of VIVO do:

Principal Investigator/Program Director (Last, First, Middle):			
<b>BIOGRAPHICAL SKETCH</b>			
Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. DO NOT EXCEED FOUR PAGES.			
NAME Schleyer, Titus		POSITION TITLE Associate Professor and Director, Center for Dental Informatics, University of Pittsburgh	
eRA COMMONS USER NAME titus1			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(S)	FIELD OF STUDY
The Fox School of Business, Temple University, Philadelphia, PA	MBA	1985	Health Administration
School of Dentistry and School of Medicine, University of Frankfurt am Main, Frankfurt/M, Germany	PhD	1989	Molecular Biology
School of Dentistry, University of Frankfurt am Main, Frankfurt/M, Germany	DMD	1987	Dentistry
Temple University, School of Dentistry, Philadelphia, PA	DMD	1991	Dentistry

A. Positions and Honors.

- **Generate** CVs and biosketches for faculty reporting or grant proposals - NIH/NSF.
- **Incorporate** external data sources for publications and affiliations.
- **Link** data to external applications and web pages.

Try it at <http://vivo.ufl.edu/display/n25562>

[American Psychological Association VIVO](#)  
[Bournemouth University Academic Pages](#)  
[Brown University VIVO](#)  
[Cornell University VIVO](#)  
[Curtin University of Technology Metadata Hub](#)  
[Duke University VIVO](#)  
[Eindhoven University of Technology VIVO](#)  
[Griffith University Research Hub \(VIVO\)](#)  
[Hunter College VIVO](#)  
[Indiana University VIVO](#)  
[Johns Hopkins University VIVO](#)  
[Massachusetts Institute of Technology VIVO](#)  
[Medical College of Wisconsin VIVO](#)  
[New York University Langone Medical Center VIVO](#)  
[Northeastern University VIVO](#)  
[Notre Dame University VIVO](#)  
[Otago Research Data Registry](#)  
[Penn State University VIVO](#)  
[Queensland University of Technology VIVO](#)  
[RPI Center for Nanoscale Innovation VIVO](#)  
[SUNY Research in Academic Health VIVO](#)  
[The Scripps Research Institute VIVO](#)  
[UCLA VIVO](#)

# VIVO Adoption

See details at <http://nm.cns.iu.edu>

[University of Arkansas for Medical Sciences VIVO](#)  
[University of Cambridge VIVO](#)  
[University of Colorado VIVO](#)  
[University of Florida VIVO](#)  
[University of Hawaii VIVO](#)  
[University of Melbourne Find an Expert \(VIVO\)](#)  
[University of Nebraska VIVO](#)  
[University of New Mexico VIVO](#)  
[University of North Texas VIVO](#)  
[University of Pennsylvania VIVO](#)  
[University of Virginia VIVO](#)  
[University of Washington VIVO](#)  
[University of Western Australia VIVO](#)  
[USDA VIVO](#)  
[Weill Cornell Medical College VIVO](#)



**VIVO FACULTY SEARCH DEMO**  
Using Apache Solr for federated search

Navigation: HOME, SEARCH, ANALYTICS, MEDICINE, MOSIER, DR. DON, DYNAMIC, ITS GEN, SALVATI, EDUARDO AGUSTIN

Harvard Catalyst Profiles

Keywords: information

Institution	Matches
Cornell University	0
Harvard University	1104
Indiana University	3
Ponce School of Medicine	0
Stanford University School of Medicine	993
The Scripps Research Institute	40
University of Florida	357
University of Iowa	72

Salvati, Eduardo Agustin  
Thromboembolism and infection in total hip ... the postoperative risk of deep vein thrombosis and pulmonary embolism. Infection is the most devastating local ... and the therapeutic options to cure the infection ...

<http://vivo.cornell.edu/individual/individual117878>

# Profiling Systems at IU

IU currently has four systems—more than any other university I know is able to afford.

Only **VIVO** and **IndianaCTSI** have exchanged data.

**SciVal** and **Pivot** are commercial solutions that are not interoperable.

Other universities have conducted extensive market studies - see comparison of 45 systems at [http://en.wikipedia.org/wiki/Comparison\\_of\\_Research\\_Networking\\_Tools\\_and\\_Research\\_Profiling\\_Systems](http://en.wikipedia.org/wiki/Comparison_of_Research_Networking_Tools_and_Research_Profiling_Systems) - and decided to implement a combination of SciVal (to purchase publications) and VIVO (to be compliant with many other systems that expose their data using the VIVO ontology in support of national search and other services across profiling instances).

Many universities are using their Faculty Profiling System to compile large teams in response to funding solicitations. Purdue has connected their profiling system to their FAR like 'Digital Measures' system and will soon be able to analyze and visualize their impact in new ways.

I believe we all would benefit if IU commits to one Faculty Profiling System but it will take IU leadership to make this happen.



# Data in VIVO at IU

## **VIVO development instance**

- Bloomington faculty (source: IUIE data warehouse)
- IUPUI faculty (source: IUIE data warehouse)
- IU CTSI personnel (source: CTSI Portal, IUIE data warehouse)
- Inclusion of a faculty member entails basic HR data (appointments, rudimentary contact info), academic courses taught in last five years, and federal or federal pass-through grant awards for which they were PI or co-PI.
- IUCTSI personnel may additionally include a research overview and research area keywords.
- IUB and IUPUI organizational structure

## **VIVO production instance**

- Bloomington faculty (source: IUIE data warehouse)
- IU CTSI personnel (source: CTSI Portal, IUIE data warehouse)
- Inclusion of a faculty member entails basic HR data (appointments, rudimentary contact info), academic courses taught in last five years, and federal or federal pass-through grant awards for which they were PI or co-PI.
- IUCTSI personnel may additionally include a research overview and research area keywords.
- IUB and IUPUI organizational structure

Provost Robel suggested to explore **linking VIVO and FAR**—this would considerably improve data quality and coverage.



# VIVO Usage at IU

## Networks and Complex Systems Research at Indiana University

This VIVO instance provides information on networks and complex systems

- [Faculty](#) and their [departments](#)
- [Publications](#)
- [Grants](#)
- [Courses](#)

at Indiana University. The site was created in support of a NSF IGERT grant application. A major intent is to cross-fertilize between research done in the social and behavioral sciences, research in natural sciences such as biology or physics, but also research on Internet technologies.

The site will be continuously updated to help

- New faculty to get in contact with relevant researchers.
- Faculty and policy makers to pool teams in response to funding solicitations.
- Faculty to coordinate research efforts – collaborations using existing funding/resources.
- Faculty to coordinate teaching.
- Students identify relevant courses, potential advisors, funding.
- Organize the Mon talk series on [Networks and Complex Systems](#).
- Arrange research meetings for visitors with relevant faculty/students
- Communicate networks and complex systems research at IU via interlinked web pages to the world.

We welcome all comments and suggestions. Please feel free to contact [Katy Börner](mailto:Katy Börner) [katy@indiana.edu](mailto:katy@indiana.edu) at the [Cyberinfrastructure for Network Science Center](#), SLIS, IUB. Make sure to use "VIVO-NetSci" in the subject header.

<http://vivo-netsci.slis.indiana.edu>

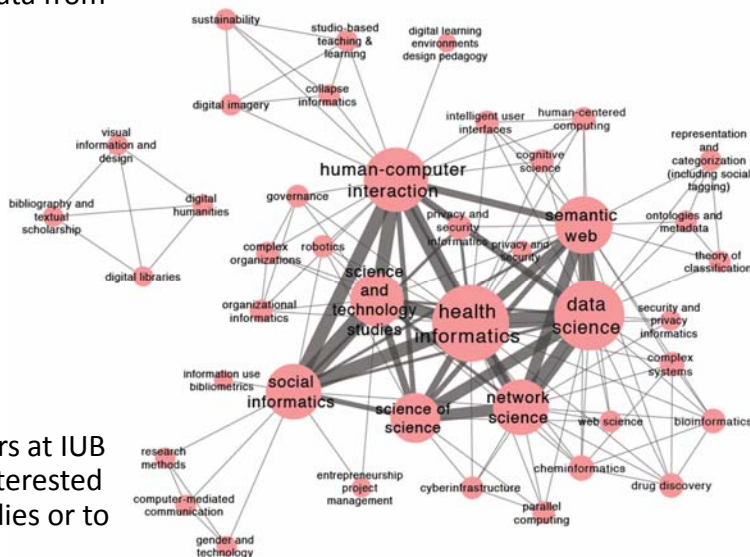


# VIVO Usage at IU

We started to run analyses of teaching/funding/affiliation data from <http://vivo.iu.edu> to identify collaborations/connections/overlaps for the SLIS-SOIC merger.

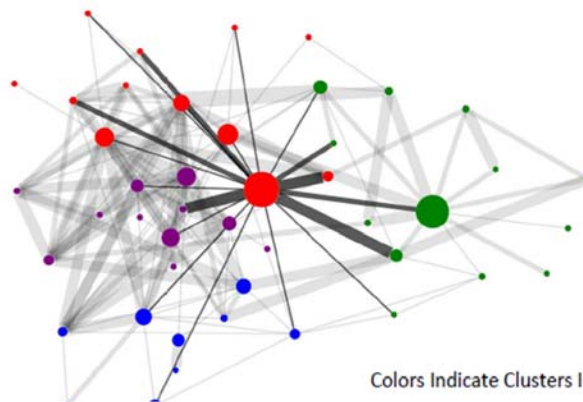
The very same analyses might be valuable for other reorganization efforts.

There are about 10 science of science/scientometrics scholars at IUB and several of us would be interested to perform more detailed studies or to provide advise.





# VIVO Usage at UMich

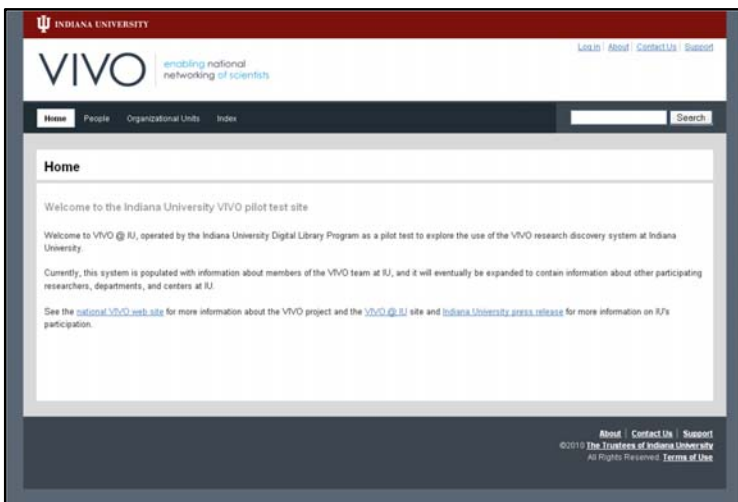


Colors Indicate Clusters Identified by Algorithm

Key  
● Researcher  
— Co-Authorship    ●●● Increasing 'Betweenness Centrality' (Bridging Effect on Network)  
— Co-Participation on Sponsored Project    — Co-Authorship and Co-Participation on Sponsored Project

**P30 Member Collaborations – Sponsored Project Co-Participation and Co-Authorship Network.** Used in **successful!** P30 funding application. Shows the PI's relationships with various P30 members, conveying that the PI was not only the formal center of the group but also the informal center and the person who exhibited the highest betweenness centrality. Contact: Jeffrey Horon, [J.Horon@elsevier.com](mailto:J.Horon@elsevier.com)

## VIVO Research & Expertise Across Indiana University



### Questions?

Chin Hua Kong  
[kongch@indiana.edu](mailto:kongch@indiana.edu)

Robert Light  
[lightr@indiana.edu](mailto:lightr@indiana.edu)

Katy Borner  
[katy@indiana.edu](mailto:katy@indiana.edu)

Thank you!

# We Are Hiring

## **Senior Software Engineer/Research Analyst (3IT) IU Job #6839**

As Senior Software Engineer, you will perform research and programming for current and future externally funded research projects at the CNS Center. These projects include tools powered by the Cyberinfrastructure Shell (CIShell, <http://cishell.org>), an open-source software platform that supports the interchange of datasets and algorithms; MapIN, a map of Indiana's expertise and resources; and other online interactive maps and web sites. You will participate in the entire software development process, from the collection of user stories through planning, implementation, testing, deployment, and documentation. You will also be expected to participate in the training new developers, and the creation of educational material for workshops. As Senior Software Engineer, you will have a chance to help set the standards of our team in many areas, including code, teamwork, product direction, and process.

## **Software Developer (2IT) IU Job #6862**

As a Software Developer, you will work in a team of four to perform research and programming for current and future externally funded research projects at the CNS Center. The main focus will be on tools powered by the Cyberinfrastructure Shell (CIShell, <http://cishell.org>). CIShell is an open-source software platform, built on Java and OSGi that allows developers and scientists to easily exchange datasets and algorithms, and bundle them into custom tools that serve the particular needs of research communities. You will participate in the entire software development process, from the collection of user stories through planning, implementation, testing, deployment, and documentation.